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Indiana Department of Education

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ISTEP+: Grade 6

Science

Parent Guide to ISTEP+ Scoring

Introduction

Indiana students in Grades 3-8 participated in the *ISTEP+* Spring 2014 administration. The test for *ISTEP+* in Spring 2014 consisted of an Applied Skills section administered in March and a Multiple-Choice section administered in late April and early May. For all grades, the Applied Skills section of the assessment was handscored by trained evaluators. The Multiple-Choice section was machine-scored. Scores for the Applied Skills and Multiple-Choice sections are combined to generate a student's total score.

Test results for both the Multiple-Choice and Applied Skills sections, as well as images of the Applied Skills student responses, are available online. It is the expectation of the Indiana Department of Education that schools will take this opportunity to have a conversation with parents and students about the results. As a springboard for this conversation, the Indiana Department of Education has created this document which outlines the released Applied Skills questions and includes brief scoring notes that describe the given score points and explain the scoring rules and expectations for the individual questions.

This document consists of:

- a brief description of the types of questions assessed
- a short summary of scoring rules utilized by the trained evaluators
- a copy of the released Applied Skills questions
- anchor papers used by evaluators to distinguish between rubric scores

NOTE: The Applied Skills operational questions are released at the end of each test administration. It is important to keep in mind that a significant portion of a student's score is calculated from the Multiple-Choice section of the assessment, which is not addressed within this document.

QUESTION TYPES

This document addresses the Applied Skills section of *ISTEP+*, which allows students to demonstrate their understanding of content in a variety of ways. The Applied Skills Assessment consists of constructed-response (CR) and extended-response (ER) questions. CR and ER questions are cognitively more demanding than multiple-choice (MC) questions. ER questions are typically more complex and will likely require more steps to respond.

SCORING

For the Applied Skills Assessment, each question is scored according to a rubric. Rubrics clearly define the requirements for each score point. Each student response is evaluated individually to determine whether it is acceptable. This allows student scores to be reported as accurately as possible. To ensure consistency when scoring the *ISTEP+* questions, CTB/McGraw-Hill works closely with assessment specialists at the Indiana Department of Education and teacher committees to set guidelines for scoring student responses. Committees look at several student papers and score them using the rubrics. Some of the student responses are selected as anchor papers and are used as clear examples of specific score points. Samples of anchor papers are presented within this document. Scoring supervisors then use anchor papers and approved, scored student responses to ensure that responses are evaluated appropriately and consistently. Individuals who evaluate and score *ISTEP+* student responses must have a four-year college degree and pass a series of qualifying tests on specific questions before they can evaluate any student responses.

If a response is unscorable, it is assigned one of the following condition codes:

A Blank/No Response/Refusal
B Illegible
C Written predominantly in a language other than English
D Insufficient response/Copied from text
E Response not related to test questions or scoring rule

Each CR question is scored according to its own rubric and has a maximum of 2 score points. The ER question is also scored according to its own rubric and has a maximum of 4 score points. For all Applied Skills questions, the maximum score point value is desired, but students can receive partial credit on questions. For example, it is possible for students to receive 1 point for a CR question or 1, 2, or 3 points for the ER question.

For some questions, students are expected to explain and justify their responses. Students' ability to communicate concepts is critical in understanding science and is emphasized in Indiana's Science Standards.

Additionally, students are not penalized for:

- spelling or grammar errors
- using abbreviations; for example, both *cm* and *centimeters* are acceptable

For additional information regarding *ISTEP+* or other student assessments, please contact the Indiana Department of Education by calling 317-232-9050 or writing via email: istep@doe.in.gov.

The chart below summarizes the question types used to measure a student's mastery of content, the assessment that contains the particular question type, the standards assessed in each assessment, and the scoring method used to evaluate a student's response given the question type.

Scoring Note: All student responses to questions found in each Applied Skills Assessment are handscored using the specific rubric(s) outlined in the column labeled "Scoring Method." As indicated in the chart, all multiple-choice questions are machine scored.

Question Type	Assessment	Standards Assessed	Scoring Method
Multiple-Choice	Multiple-Choice Assessment	All	Machine-Scored
Constructed-Response (CR)	Applied Skills Assessment	All	Analytic Rubric
Extended-Response (ER)	Applied Skills Assessment	All	Analytic Rubric

More information is available regarding these assessment topics on the Office of Student Assessment homepage at http://www.doe.in.gov/assessment.

Constructed-Response
Standard 2: Earth and Space Science

Question 1

The force of gravity on the moon is about one-sixth of the force of gravity on Earth. Suppose that an astronaut travels to the moon.

How will the astronaut's mass on the moon compare with his mass on Earth? Explain your answer.

How will the astronaut's weight on the moon compare with his weight on Earth? Explain your answer.

Key Element(s):

- Any response indicating that the astronaut's mass will be the same on Earth as it is on the moon.
  AND
- Any response indicating mass stays the same regardless of the strength of the force of gravity exerted on it (i.e., mass is a measure of the amount of matter in an object and is not affected by gravity).

- Any response indicating that the astronaut's weight will be less on the moon than it is on Earth.
  AND
- Any response indicating that weight is a measure of the force of gravity on an object (i.e., the weight of an object is dependent on the strength of the force of gravity exerted on it so the weight changes with the strength of the force of gravity.)

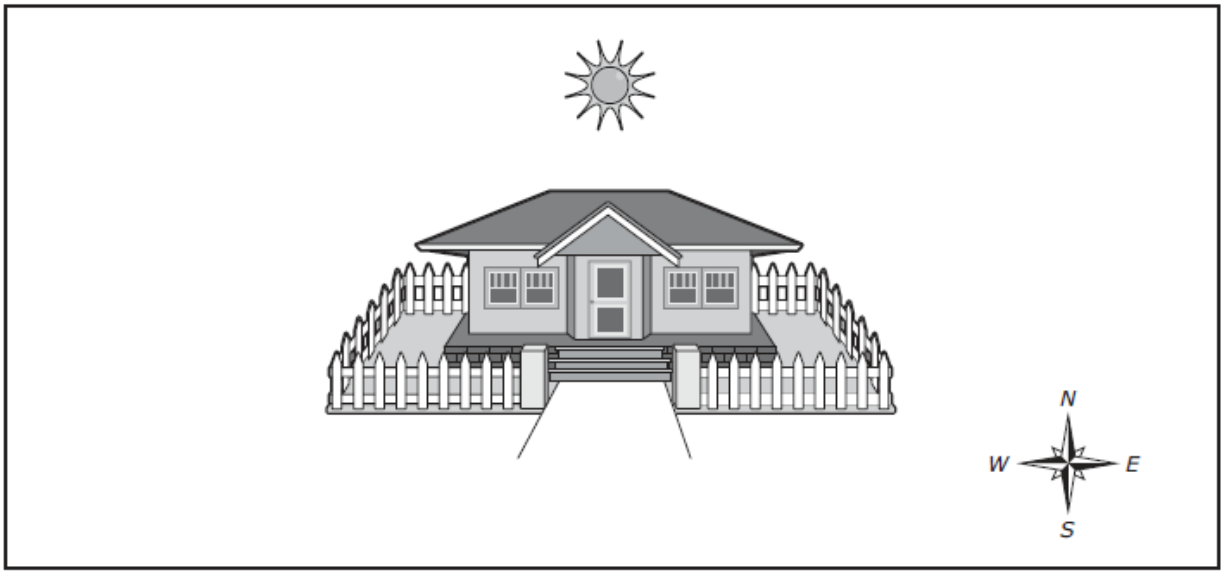
Rubric:

2 points	Two key elements
1 point	One key element
0 points	Other

Constructed-Response
Standard 2: Earth and Space Science

Question 2

The diagram below shows the sun shining over a house.



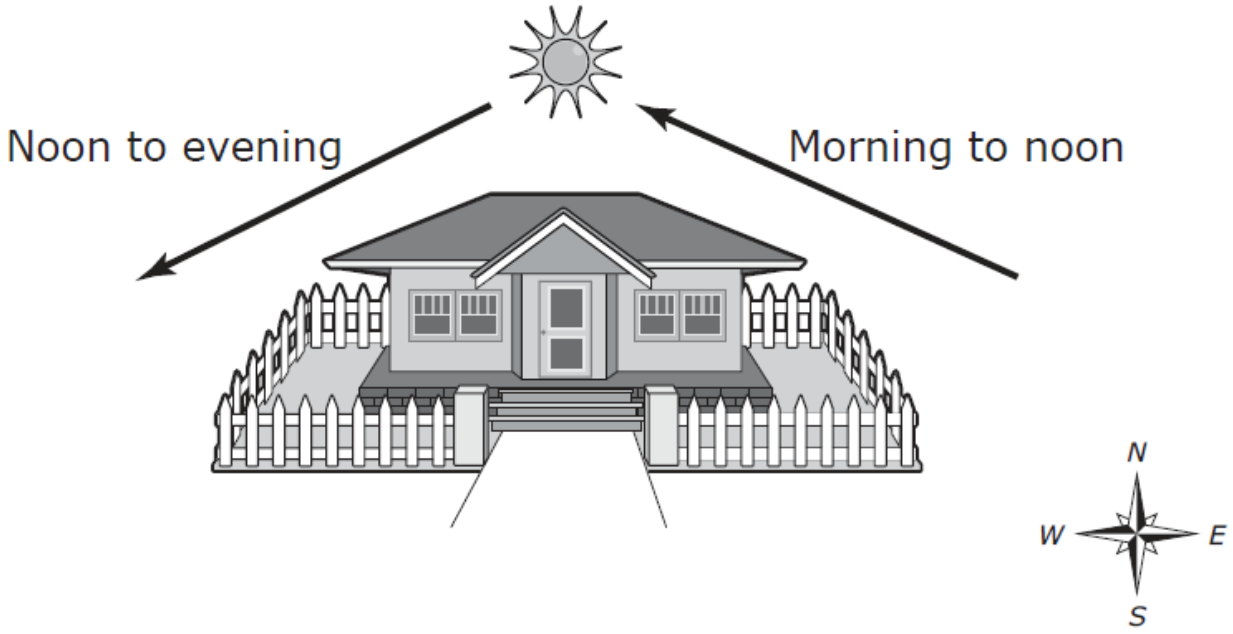
Draw an arrow showing how the sun appears to move across the sky from morning to noon. Be sure to label this arrow "morning to noon."

Draw another arrow showing how the sun appears to move across the sky from noon to evening. Be sure to label this arrow "noon to evening."

Explain why the sun rises and sets in different places each day as the seasons change.

Key Element(s):

- Arrows should show that the sun rises in the east in the morning and sets in the west in the evening (with appropriate labels).



- Any response that indicates that the tilt of Earth's axis and the position of Earth in its orbit around the sun together cause the sun to rise and set in different places each day as the seasons change.

Rubric:

2 points	Three key elements
1 point	Two or one key elements
0 points	Other

Constructed-Response
Standard 5: The Nature of Science

Question 3

A student performs an experiment using a toy car and a ramp.
The student collects the data shown in the table below.

Ramp Height centimeters (cm)	Ramp Length (cm)	Trial 1: Distance (cm)	Trial 2: Distance (cm)	Trial 3: Distance (cm)
10	30	37	36	39
12	30	42	45	45
16	30	50	51	49
20	30	61	64	62

Identify the changed variable in this experiment.

Changed variable (independent variable) _____

Identify the measured variable in this experiment.

Measured variable (dependent variable) _____

Identify ONE controlled variable in this experiment.

Controlled variable _____

Key Element(s):

- (changed variable) ramp height

- (measured variable) distance the toy car traveled

- Any ONE of the following (controlled variable):
  - ramp length
  - car used
  - ramp used
  - surface car rolls across

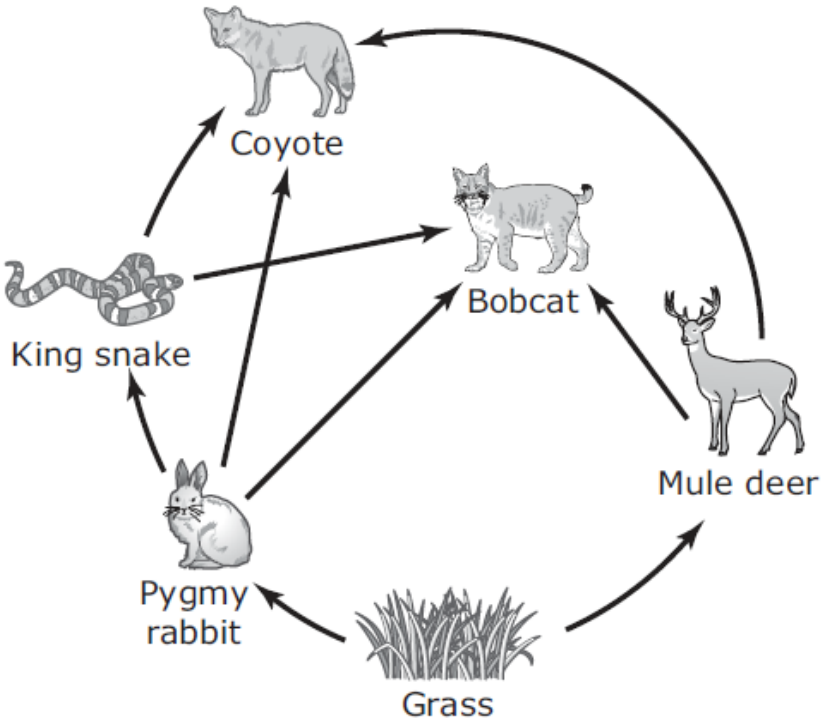
Rubric:

2 points	Three key elements
1 point	Two or one key elements
0 points	Other

Extended-Response
Standard 3: Life Science

Question 4

A food web from the western United States is shown below.



Many years ago, the mule deer population in the western United States was very small. To help the mule deer increase its numbers, humans removed the predators of mule deer from an area where mule deer lived. The mule deer population in the area increased quickly and became much larger than in the past.

Describe how the large increase in mule deer MOST LIKELY affected the populations of grasses in the area and EXPLAIN why.

Describe how the large increase in mule deer MOST LIKELY affected the population of pygmy rabbit in the area and EXPLAIN why.

Describe how the large increase in mule deer MOST LIKELY affected the population of king snakes in the area and EXPLAIN why.

Describe how the large increase in mule deer and the lack of predators MOST LIKELY affected the mule deer population in the area after several more years and EXPLAIN why.

Key Element(s):

- Any response indicating that the populations of grasses most likely decreased.
  AND
- Any response indicating that the decrease in grasses occurred because there were more mule deer eating the grasses and shrubs.

- Any response indicating that the population of pygmy rabbit most likely decreased.
  AND
- Any response indicating that the decrease in pygmy rabbit occurred because there were more mule deer competing with the pygmy rabbit for food (i.e., grasses).

- Any response indicating that the population of king snakes most likely decreased.
  AND
- Any response indicating that the decrease in king snakes occurred because there was a reduction in pygmy rabbit, which are the king snake's food source (the reduction in pygmy rabbit occurred because there were more mule deer competing with the pygmy rabbit for food (i.e., grasses)).

- Any response indicating that the mule deer population most likely decreased.
  AND
- Any response indicating that the decrease in mule deer population occurred because the area could not support/didn't have enough food/living space/shelter for the larger population of mule deer (as a result the numbers of mule deer decreased until there was enough food/living space/shelter in the area to support the mule deer population).
  OR
- Any response that indicates that after several years the population will even out and come to carrying capacity where there are just enough resources to support the population of mule deer.

Rubric:

4 points	Four key elements
3 points	Three key elements
2 points	Two key elements
1 point	One key element
0 points	Other
